

In response to the November 21, 2002 Examiner's Action, please amend the above-identified application as follows:

**IN THE CLAIMS:**

Please replace claim 8 with the following rewritten claim:

a' 8. (Amended) The method of claim 7 wherein said rare-earth doped fiber amplifier is doped with erbium.

**STATUS OF CLAIMS**

Claims 1-35 are pending.

**REMARKS**

Claims 1-35 are pending in this application, claims 1, 9, and 21 being the independent claims.

Claim 8 is amended to place the claim in proper dependent form per the Examiner's objection in Paragraph 3 of the Office Action.

Claims 1-3, 5-10, 12-13, 18-19, and 33-35 stand rejected under 35 U.S.C. 102(e) as being anticipated by Drake et. al, U.S. Patent No. 6,377,394. In addition, claims 4 and 11 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Drake in view of allegedly admitted prior art. Claims 14-17, 20-29, and 30-32 stand rejected as being unpatentable over Drake in view of various combinations of Denkin, U.S. Patent No. 6,356,386. These rejections are hereby traversed for the following reasons.

The present invention provides a method and apparatus for automatically controlling the gain of an optical amplifier. Automatic gain control (AGC) is achieved by adjusting the pump power supplied to the optical amplifier. The pump power is determined in accordance with both feed-forward and feedback error signals. As discussed on page 3, lines 4-25 of the specification, in a feed-forward arrangement the pump power is adjusted based solely on changes to a parameter that is input to the optical amplifier such as the input power, for example. In a feedback arrangement, the pump

power is adjusted based on at least one output parameter (e.g., the output power), and possibly an input parameter as well.

The Examiner asserts that Drake et al. discloses an AGC arrangement in which both feedback and feed-forward control signals are employed. In particular, the Examiner points to column 4, lines 36-40 of the patent as referring to the use of a feed-forward control signal.

Applicants respectfully submit that Drake et al. only refers to an AGC arrangement employing feedback and not a feed-forward control signal. As detailed below, Applicants furthermore believe that the Examiner has used Applicants' own teachings to infer more into the cited passage than is warranted.

Turning first to the paragraph beginning at column 4, line 22, the reference states that a circuit 24 derives an error signal using the measured input and output powers. This paragraph further describes how the circuit 24 calculates the desired or target output power. Specifically, the target output power is the product of the measured input power and the desired gain. The next paragraph, beginning at column 4, line 31, states that the error signal, which is the difference between the target output power and the measured output power, is used to control the pump sources to achieve the required gain. That is, since the measured output power (as well as the measured input power) is used to determine the error signal that controls the pump sources, the pump sources are controlled by a feedback signal.

The next paragraph, beginning at column 4, line 35, is reproduced in its entirety immediately below:

Changes in the pumping conditions may be required in response to changes in the input signal, for example in response to the adding or dropping of WDM channels. The error signal is supplied to a processor 26 which calculates a target pump level for the system, this target pump level being used to drive the three laser diode pump sources  $P_1$  to  $P_3$ .

The Examiner asserts that the use of a feed-forward signal is disclosed in the above-cited paragraph. Applicants however, fail to discern such a teaching. The first sentence is simply a factual statement that is true for all AGC schemes that operate by controlling the pump power, regardless of whether a feed-forward or feedback scheme is employed. For

example, while it is certainly true that a change in the input signal may require a change in pump power in order to maintain a constant gain, the change in pump power nevertheless may be determined by both the input and output signals (i.e., feedback). This sentence does not suggest that the change in pump power is to be determined exclusively by the input signal (i.e., feed-forward). The second sentence of this paragraph then returns to a discussion of the error signal derived by circuit 24. Specifically, the second sentence describes how the processor 26 uses the error signal to calculate the appropriate pump power. This paragraph says nothing about modifying the error signal as it was originally defined so that it is based exclusively on changes in the measured input power. Rather, the error signal referred to in this paragraph is the error signal derived by circuit 26 and which was defined at column 4, lines 31-34, which, as previously noted, is a feedback signal.

The Examiner's interpretation of the previously cited paragraph can only be achieved with the improper use of hindsight based on the Applicants' own invention. While that paragraph may be arguably consistent with a feed-forward scheme (as well as a feedback scheme), only the present invention explicitly teaches the use of both a feedback and a feed-forward arrangement.

### **CONCLUSION**

For at least the above reasons it is respectfully requested that the rejection of independent claims 1 and 9 under 35 U.S.C. 102(e) and claim 21 under 35 U.S.C. 103(a) be reconsidered and withdrawn. The rejection of claims 2-8, 10-20, and 22-35 should also be reconsidered and withdrawn since these claims depend from and further define the invention of claim 1, 9 and 21.

In view of the foregoing, it is believed that the application is now in condition for allowance and early passage of this case to issue is respectfully requested. If the Examiner believes there are still unresolved issues, a telephone call to the undersigned would be welcomed.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned **"Version with markings to show changes made."**

Per the Examiner's request in the Office Action dated November 21, 2002, a Request for Approval of Proposed Drawing Changes is filed herewith.

**Fees**

The Examiner is authorized to charge all fees due and owing in respect to this amendment to deposit account number 50-1047.

Respectfully submitted,



Stuart H. Mayer  
Registration No. 35,277

Attorney for Applicant  
Mayer Fortkort & Williams PC  
251 North Avenue West, 2<sup>nd</sup> Floor  
Westfield, NJ 07090  
(908) 518-7700 Tel.  
(908) 518-7795 Fax

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**Version with markings to show changes made**

**In the Claims:**

8. (Amended) The method of claim [8] 7 wherein said rare-earth doped fiber amplifier is doped with erbium.